Remarks/Arguments:

Claims 1-27 are rejected. Claim 1 has been amended. Claims 28-33 are newly added. Claims 1-33 are pending. No new material is introduced herein.

Claims 13, 14, 15 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In particular, the claims include the feature: the "step of resetting usage of the selected trained patterns and the determined distortion coefficient." This feature is rejected as lacking description in the specification. The rejection is respectfully traversed. This feature is described in the specification; for example, p. 17, lines 35-39, p. 18, lines 1-27 and in Fig. 7, feature 701. Withdrawal of the rejection is respectfully requested.

Claims 1, 4, 7, 10 and 16-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Digalakis et al. (U.S. Patent No. 5,864,810) in view of Sejnoha (U.S. Patent No. 5,008,941). This rejection is respectfully traversed for the reasons set forth below.

Applicants' invention, as recited by amended claim 1 includes features which are neither disclosed nor suggested by the art or record, namely:

> ... selecting, based on a first utterance by a speaker, adaptable trained patterns from a plurality of stored trained patterns ...
>
> ... finding a distortion coefficient fixed by spectral region of speech for an utterance ... based on the first utterance by the speaker and the selected trained patterns ...
>
> ... recognizing an input speech sound following the first utterance by using the selected trained patterns and the distortion coefficient ... (Emphasis Added)

Digalakis et al. discloses a speech recognition apparatus and method that obtains hidden Markov model parameters from speech sound data of a prepared speaker and converts the prepared speaker independent model to a speaker adapted model. During training, transcribed sentences from a group of speakers (col. 6, lines

39-40) are used in clustering engine 120 that operates on trained models 117 to create a set of tied models (col. 6, lines 45-47). Clustering engine 120 is not used for untranscribed speech. For untranscribed speech, Digalakis et al. supplies a feature data set to recognition engine 110 using models stored in 117 to determine a most probable path of speech states (col. 6, line 67- col. 7, line 5). Adaptation engine 113 creates state transformations after receiving an amount of data from a new speaker (col. 7, lines 28-30). One example used 40 utterances of adaptation data (col. 12, lines 5-6). Digalakis et al. do not disclose nor suggest: a) "selecting, based on a first utterance by a speaker, adaptable trained patterns," b) "finding a distortion coefficient ... based on the first utterance by the speaker and the selected trained patterns" and c) "recognizing an input speech sound following the first utterance by using ... the distortion coefficient" (emphasis added). Digalakis et al. do not disclose these features.

Sejnoha discloses a speech recognition method where an adaptation vector obtained from the difference between a sample and an input speech sound is used to compensate a subsequent input with this vector. A long time average spectrum is updated and subtracted from the input speech to reduce spectral frequency distortion (col. 7, lines 5-15). Applicants' distortion coefficient, however, does not represent a spectral difference. Applicants' distortion coefficient is a function of vocal tract length (col. 10, line 10 - col. 11, line 7). The vocal tract can be modeled as an acoustic tube. Because the vocal tract length will vary by individual, an individual speech sound will shift in frequency. Thus, Applicants' distortion coefficient acts to expand or contract the frequency of an utterance to account for the vocal tract length. Sejnoha also does not disclose nor suggest Applicants' feature of selecting adaptable trained patterns based on a first utterance.

Thus, even by combining the art or record, applying Sejnoha's spectral difference to the method of Digalakis et al. may reduce noise, but will not cancel an individual speaker's vocal tract differences. Sejnoha does not make up for the features lacking in Digalakis et al. Accordingly, allowance of amended claim 1 is respectfully requested.

Claims 4, 7 and 10 include all of the features of amended claim 1 from which they depend. Accordingly, claims 4, 7 and 10 are also patentable over the art of record.

Claim 16 recites features similar to those discussed above for amended claim 1. Accordingly, claim 16 is patentable over the art of record. Allowance of claim 16 is respectfully requested.

Accordingly, claims 17-20 include all of the features of claim 16 from which they depend. Thus, claims 17-20 are also patentable over the art of record.

Claims 2-3, 5-6, 8-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Digalakis et al. and in view of Sejnoha and further in view of Kanevsky et al. (U.S. Patent No. 6,442,519). Claims 2-3, 5-6, 8-9 and 11-12 also include all of the features of amended claim 1 from which they depend.

Digalakis et al. and Sejnoha are discussed above. Kanevsky et al. disclose a speech recognition system that may take into account a speaker's region and age, Fig. 5. Users are clustered into groups, Fig 2. Kanevsky et al. do not disclose Applicants' features of selecting an adaptable trained pattern based on the first utterance of a speaker, finding a distortion coefficient, as discussed above, and applying it to a speech sound following the first utterance. Thus, Kanevsky et al. do not make up for the features lacking in Digalakis et al. and Sejnoha. Accordingly, claims 2-3, 5-6, 8-9 and 11-12 are patentable over the art of record.

Claims 22-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over Digalakis et al. and in view of Sejnoha and further in view of Geilhufe et al. (U.S. Patent No. 6,584,439). Claim 22 recites features similar to those discussed above for amended claim 1.

Digalakis et al. and Sejnoha are discussed above. Geilhufe et al. discloses a method of speech recognition where a control signal is generated by the speech recognition system to control a number of voice controlled devices. Geilhufe et al. do not make up for the features that are lacking in Digalakis et al. and Sejnoha. Accordingly, claim 22 is patentable over the art of record.

Claims 23-27 include all of the features of claim 22 from which they depend. Thus, claims 23-27 are also patentable over the art of record.

In view of the arguments and amendments set forth above, the application is in condition for allowance which action is respectfully requested.

Respectfully submitted,

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